REMARKS

By this Amendment, claims 8-14 have been canceled. No new claims have been added to the application. Accordingly, claims 1-7 and 15-21 are pending in the application. No new matter has been added to the application.

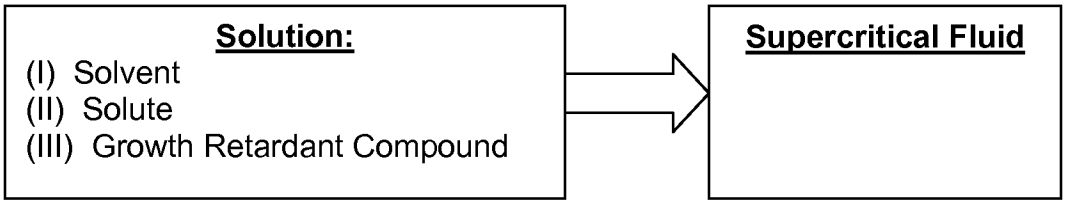
In the prior Office Action, the Examiner rejected claims 1-21 under 35 U.S.C. §103(a) as being unpatentable over Subramaniam et al., U.S. 5,874,029, in view of Henriksen et al., U.S. 6,974,593. By this amendment, applicants have canceled claims 8-14 thereby rendering the prior rejection thereof moot. However, for the reasons set forth below, applicants respectfully request reconsideration of the rejection of claims 1-7 and 15-21.

Claim 1 of the present application claims:

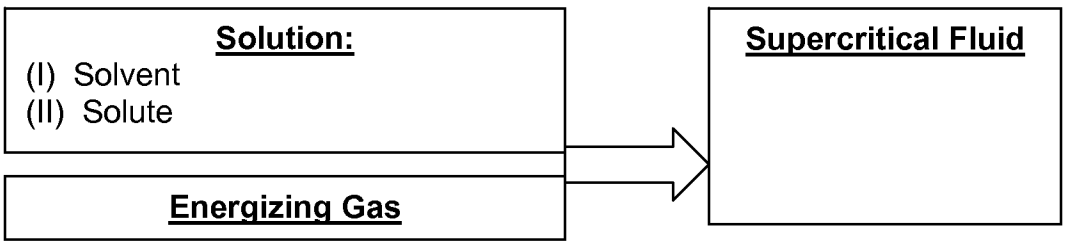
> A method of producing particles using supercritical fluid (SCF) comprising:
>
> providing a source of SCF;
>
> providing a solution comprising:
>
> at least one solvent that is at least partially soluble in the SCF;
>
> at least one solute material that is at least partially soluble in the solvent and substantially insoluble in the SCF; and
>
> at least one growth retardant compound that is at least partially soluble in the SCF and includes at least one functional group or portion that is SCF-philic and at least one functional group or portion that is SCF-phobic or solute material-philic; and
>
> contacting the solution and the SCF together under conditions whereby the solvent diffuses into the SCF causing supersaturation and nucleation of particles comprising the solute material, said particles having a smaller size and a

reduced amount of agglomeration than if no growth retardant compound was present.

Thus, in accordance with the invention as claimed in claim 1, a solution comprising a solvent, a solute and a growth retardant compound is provided, and a supercritical fluid is provided, and the solution and the supercritical fluid are contacted together, as graphically depicted below:



Like the present application, Subruamaniam et al. is also directed to a method for producing particles using supercritical fluid. However, the method according to Subrumaniam et al. is significantly different from the method claimed in claim 1. Subrumaniam et al. teaches that a solution comprising a solvent and a dissolved solute material should sprayed out of a nozzle in the form of atomized droplets into a supercritical fluid antisolvent, which causes depletion of the solvent in the atomized droplets of solution and recrystallization of the solute in the form of particles. Subramaniam et al. teaches that the solution should be introduced into the nozzle together with an "energizing gas" (which Subrumaniam et al. also refers to as a "compressed fluid" or "compressed gas" - see col. 8, lines 9-10) that exits the nozzle at a velocity such that the spray of solution is "shattered into extremely small droplets at the nozzle exit" (col. 6, line 1-8). Thus, the method according to Subrumaniam et al. can be graphically depicted as follows:



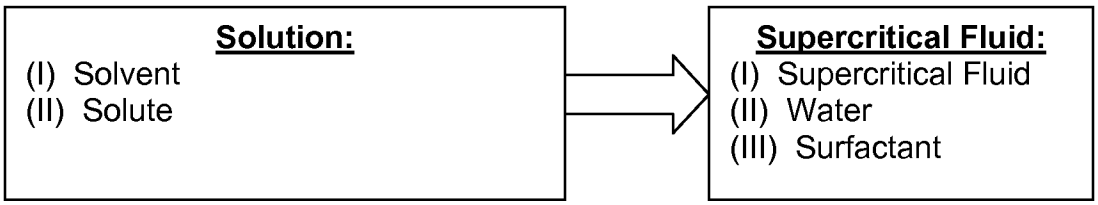
Subrumaniam et al. does not ever disclose, teach or suggest that a growth retardant compound should be mixed into the solution before the solution and the supercritical fluid are contacted together. And this makes perfect sense considering that Subramaniam et al.'s solution to the problem of obtaining small particles is to use an energizing gas to blast the solution into small particles rather than mixing a growth retardant compound (that is at least partially soluble in the SCF and includes at least one functional group or portion that is SCF-philic and at least one functional group or portion that is SCF-phobic or solute material-philic) into the solution.

The Examiner contends that because applicants claim (e.g., in claim 3) that the growth retardant compound can be selected from "fluorocarbons", and because Subrumaniam et al. mentions trifluoromethane ("CHF_3"), Subrumaniam et al. teaches the invention as claimed in claim 1. This is clearly incorrect. Subrumaniam et al. mentions trifluoromethane ("CHF_3") once, and only in the context of trifluoromethane ("CHF_3") being suitable for use as an antisolvent (i.e., the material into which the solution is atomized, and not a constituent of the solution). In order to read on applicants' invention as claimed in claim 1, Subrumaniam et al. would have to teach that trifluoromethane ("CHF_3") must be a constituent of the solution that is contacted together with the supercritical fluid antisolvent. Subrumaniam et al. simply does not teach this.

In an attempt to overcome the deficiencies in the teachings of Subrumaniam et al. as applied to claim 1, the Examiner contends that one of skill in the art would have been motivated by the teachings of Henriksen et al. to add a growth retardant compound to the solution that is contacted with the supercritical fluid antisolvent in the process according to Subrumaniam et al. Applicants respectfully disagree.

Henriksen et al. teaches methods for producing aqueous suspensions of water-insoluble drugs (see col. 6, lines 19-21) by either the rapid expansion of a supercritical fluid solution or a supercritical antisolvent process. In the supercritical antisolvent process according to Henriksen et al., a water insoluble drug is dissolved in a suitable organic solvent. The resulting solution is then contacted with a supercritical fluid antisolvent that also includes a mixture of water and a surfactant. The solvent in the solution is taken up by the supercritical fluid antisolvent, causing the solute to precipitate

into the aqueous surfactant and thereby form an aqueous suspension of solute particles. The supercritical antisolvent process according to Henriksen can be graphically depicted as follows:



First off, there is clearly no reason one skilled in the art would combine the teachings of Henriksen et al. with Subrumaniam et al. Both accomplish the same goal (reduced particle size), but do so using different means. Nevertheless, even if one were motivated by the teachings of Henriksen et al. to modify Subrumaniam et al. to include water and a surfactant in the supercritical fluid antisolvent, such combination would not read on applicants' invention as claimed in claim 1, which requires that the growth retardant compound (i.e., the surfactant) be dissolved as part of the solution that is contacted together with the supercritical fluid. In other words, combining Henriksen et al. with Subrumaniam et al. produces a process where the surfactant is in the wrong spot (i.e., it is mixed with the supercritical fluid and water rather than being present in the solution that is contacted with the supercritical fluid). Thus, the applied references, even when combined, clearly do not read on applicants' method as claimed in claim 1. Claims 2-7 depend from claim 1 either directly or through an intervening claim and are thus patentable over Subrumaniam et al. and Henriksen et al. for the same reasons that claim 1 is patentable over such references. Reconsideration is respectfully requested.

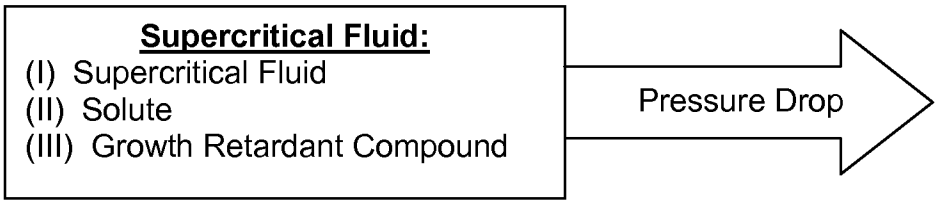
Claim 15 of the present application claims:

> A method of producing particles using supercritical fluid (SCF) comprising:
>
> providing a source of SCF;
>
> dissolving at least one solute material and at least one growth retardant compound in the SCF to form an SCF solution, wherein the growth retardant compound includes at least

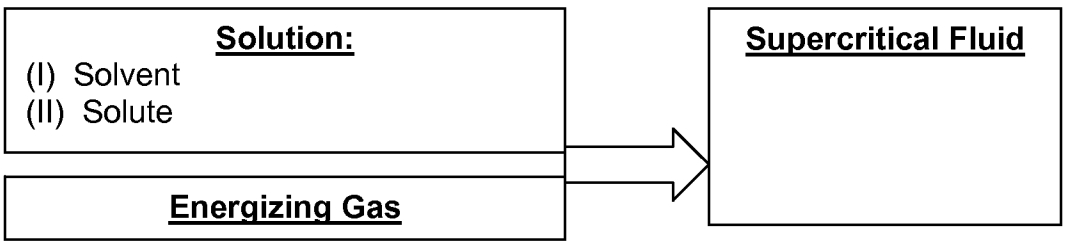
one functional group or portion that is SCF-philic and at least one functional group or portion that is SCF-phobic or solute material-philic; and

expanding SCF solution across a pressure drop below the critical pressure of the SCF whereby the SCF decompresses and causes supersaturation and nucleation of particles comprising the solute material, said particles having a smaller size and a reduced amount of agglomeration than if no growth retardant compound was present.

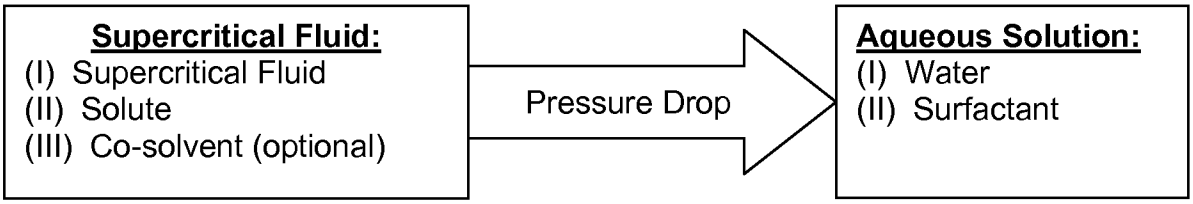
Thus, in accordance with the invention as claimed in claim 15, a solute and a growth retardant compound are dissolved in a supercritical fluid, which is then expanded across a pressure drop to produce particles, as graphically depicted below:



Subrumaniam et al. does not teach a process whereby a supercritical fluid is rapidly expanded across a pressure drop as claimed in claim 15. On the contrary, Subrumaniam et al. discloses a process whereby a solution of a solute dissolved in a solvent is sprayed through a nozzle simultaneously with an energizing gas into a volume containing a supercritical fluid, which acts as an antisolvent for the solvent and thereby causes the recrystallization of the solute as particles. As noted above, Subrumaniam et al. can be graphically depicted as follows:



Henriksen et al. does teach an embodiment of the invention in which a supercritical fluid is rapidly expanded across a pressure drop. In that embodiment of the invention, Henriksen et al. teaches that a water insoluble drug should be dissolved in a supercritical fluid (optionally in the presence of a co-solvent) and expanded across a pressure drop into an aqueous solution containing a surfactant. This embodiment of Henriksen et al. can be graphically depicted as follows:



Henriksen et al. does not disclose the same invention as claimed in claim 15, and its teachings cannot be combined with Subrumaniam et al. to read on the invention as claimed in claim 15. Claims 16-21 depend from claim 15, either directly or through an intervening claim, and are therefore patentable over Subrumaniam et al. and Henriksen et al. for the same reasons that claim 15 is patentable over such references. Reconsideration of the rejection of claims 15-21 is thus respectfully requested.

Also in the prior Office Action, the Examiner provisionally rejected claims 1-21 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 9-13, 15 and 16 of copending application No/ 10/534,665 and co-pending application No. 10/789,422. Applicants reserve the right to file terminal disclaimers to obviate the double-patenting rejections.

Conclusion

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge the same to Deposit Account No. 18-0160, Order No. FER-14857.001.001.

Respectfully submitted,

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